

Why it's convenient to measure argon by mass and not volume.

A note from Terry:

LAr Pressure (psia)	LAr Density (kg/m ³)
14.7	1395
33	1342
52	1306
70	1277
88	1253
107	1231
125	1211
144	1193
162	1175
181	1159
199	1143
217	1128
236	1113
254	1098
273	1084
291	1070
309	1056
328	1043
346	1029
365	1015

If using volume to measure argon quantity, any changes in pressure must be taken into account. Also, while Airgas (the supplier of argon to Fermilab) supplies dewars according to volume (160 and 180 L), they fill them by according to weight. According to Dave Miller of Airgas, four types of argon dewars are supplied to Fermilab:

Dewar Type	Spec. Weight (lbs)
160L 230 psi	461
160L 350 psi	438
180L 230 psi	505
180L 350 psi	467